THE MINERAL INDUSTRY OF NEW ZEALAND

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In 2003, New Zealand's mining industry included a wide variety of mineral deposits. Owing to diverse geology and a dynamic tectonic history, New Zealand's economic minerals include metallic and industrial minerals and coal, natural gas, and petroleum. Although gold and silver continued to dominate the metal mining sector in 2003, coal mining and the production of a wide assortment of industrial minerals, which ranged from bentonite to zeolite, also were prominent and important for New Zealand's economy. Excluding the petroleum industry, the value of New Zealand's minerals production was estimated to be about $635 million in 2003, or less than 1% of the of the country's estimated gross domestic product of approximately $78 billion (U.S. Central Intelligence Agency, 2003§[1]). The mining industry also contributed to other sectors of the economy, such as agriculture (fertilizer), primary industry (coal and ironsand), manufacturing (industrial minerals), and transportation (road aggregate).

The main categories of New Zealand mineral production were gold and silver, industrial minerals, ironsand, and other metals. The predominant industrial minerals of New Zealand were aggregate (crushed stone and gravel), building and dimension stone, clay, diatomite, dolomite, feldspar, lime and limestone for agriculture and industrial use, magnesite, marble, phosphate rock, salt, sulfur, and zeolite.

Government Policies and Programs

The Crown Minerals Act 1991 sets the broad legislative policy for prospecting, exploration, and mining of Crown-owned (meaning Government-owned on behalf of all New Zealanders) minerals in New Zealand. These include all in-ground gold, silver, and petroleum, and approximately one-half of the in-ground coal, nonmetallic and other metallic minerals, industrial rock, and building stone. The Minister of Energy prepares and manages the Minerals Program for Minerals and the Minerals Program for Coal, which together outline the policies on which the Government bases its management decisions and the procedures and provisions that must be followed to implement the requirements of the Crown Minerals Act (Ministry of Economic Development, 2003d§).

When the Crown Minerals Act was enacted in 1991, the intention was always that existing mining licenses under the old regime would not be able to be renewed or extended. To continue mining after any current mining license expired, the holder would transfer to the new permitting system under the Crown Minerals Act. This was widely understood within the industry and was the basis upon which officials and industry proceeded from 1991 onward (NZ Mining Updates, 2003a).

The Crown Minerals Amendment Act was passed by Parliament on August 14, 2003, which strengthened the Crown Minerals Act 1991 by recognizing the original policy intention of the Crown Minerals Act as it was passed in 1991. By removing the right of mining license holders to extend or renew their licensees, the Act addresses issues that arose through recent court decisions on the transition from the repealed Mining Act 1971 and Coal Mines Act 1979 to the Crown Minerals Act 1991.

In June 2003, the Institute of Geological and Nuclear Sciences Ltd. was awarded new funding for petroleum research by the Foundation for Research, Science & Technology. The $12.6 million award was to be used within a 6-year period to quantify and characterize elements of New Zealand's petroleum systems and to identify regions with petroleum potential by improving the understanding of the geology of the country's sedimentary basins (Ministry of Economic Development, 2003p§).

The Government announced in December 2003 that it would proceed with the sale of its 11% share in the Kupe gasfield and oilfield to the state-owned electricity generator Genesis Power Ltd. to facilitate development of the field. The Government had announced its plan to make the sale to Genesis in April 2002. The sale was suspended in May, however, to enable the Government to receive and consider the Waitangi Tribunal's petroleum report, in which claim was made that the Maori have an interest in oil and gas leases within the country; the Tribunal's report had recommended that the Government's share in Kupe be available for inclusion in Treaty settlements. The Government did not agree with the Tribunal's findings and confirmed its view that publicly owned petroleum assets were not available for use in settling Treaty of Waitangi claims. To support its conclusion, the Government cited the 1937 Oil and Petroleum Act, which essentially stated that oil and gas are completely Government issues, which means that oil and gas belong to the Government. These findings paved the way for the sale (Ministry of Economic Development, 2003b§, q§; Rigzone.com, 2003§).

Production and Trade

The Ministry of Energy announced in July 2003 that coal and gold were New Zealand's leading export-earning mineral commodities in 2002 (the latest year for which data were available); coal exports more than doubled since 1999. Cement, clay, ironsand, salt, and silver also were important contributors to the 2002 export earnings, which reached approximately $325.3 million; this was the highest amount ever and a 70% increase over the 4 years since 1998 when exports were valued at about $191.7 million. Total production of the mining industry in 2002 was about $596.7 million, which was an increase of about $153.4 million, or 35%, since 1998 (Ministry of Economic Development, 2002c§).

[1]References that include a section mark (§) are found in the Internet References Cited section.

Structure of the Mineral Industry

In addition to the numerous coal and industrial minerals operations, the petroleum wells, and a decreasing number of gold-silver mines, New Zealand had three large downstream processing plants.

New Zealand Aluminum Smelters Ltd. (NZAS) operated the Tiwai Point Smelter at Bluff near New Zealand's southernmost city of Invercargill on South Island. NZAS was owned by Comalco New Zealand Ltd. (a wholly owned subsidiary of Rio Tinto Plc of the United Kingdom) (79.36%) and Sumitomo Chemical Co. of Japan (20.64%). The smelter was commissioned in 1971 with a single reduction line following the development of the Manapouri hydroelectric scheme. Tiwai Point was chosen as the site for the smelter because aluminum smelting requires a large and very reliable power source to supply electricity continually to the reduction cells; also, because Tiwai Point was close to the deep water port of Bluff and the well-established infrastructure of the city of Invercargill, which would help ensure the availability of employees and general supplies.

The smelter has undergone upgrades several times, including a major upgrade in 1996. At yearend 2003, the smelter had a carbon plant, four reduction lines, and a metal-casting facility. Annual capacity was 333,000 metric tons (t), which was in the form of t-bars, extrusion billets, and ingots. More than 90% of the smelter's production was exported mainly to Japan, the Republic of South Korea, and other Asian markets (Comalco Ltd., undated§). The alumina used to produce the aluminum at Tiwai Point was imported from Comalco's alumina refineries in Australia which, in turn, received their bauxite raw material from Comalco's Weipa Mine in north Queensland, Australia (Comalco Ltd., 2003§).

New Zealand Steel Ltd. (NZ Steel) (a wholly owned subsidiary of Australia's BlueScope Steel Ltd.) has operated the 700,000-metric-ton-per-year (Mt/yr), fully integrated Glenbrook steel mill at Glenbrook since 2002. Blue Scope was a former business group of BHP Billiton Pty Ltd. (BlueScope Steel Ltd., undated). The iron used by NZ Steel was in the form of titanomagnetite-rich sand derived from the coastal erosion of the Mount Taranaki volcanics. Two such ironsand mines are located in New Zealand—Taharoa and Waikato North Head. NZ Steel mined at both sites, but only the Waikato North Head material was used for the Glenbrook steelworks; the Taharoa ironsand was exported to Chinese and Japanese steel mills.

Commodity Review

Metals

Gold.—New Zealand had three major operating gold mines and one mine project in an advanced stage of development in 2003—the Grey River dredging operation on the Grey River, which was located 20 kilometers (km) northeast of Greymouth on the western coast of South Island; the Macraes open cut mine, which is located 55 km north of Dunedin in East Otago on the eastern coast of South Island; and the large Martha Hill open cut mine at Waihi, which is located 120 km southeast of Auckland at the base of the Coromandel Peninsula, North Island. The Reefton, or Globe Progress-Blackwater, was an advance project still under review at yearend 2003.

The Grey River alluvial gold dredge originally began operating in 1989, but the operation lasted only about 9 months. The dredge resumed operation in 1992 under the ownership of Birchfield Minerals Ltd., which sold some of the product as gold jewelry. In 2003, the Birchfield operation was granted a new tenement to the southwest of the original property, which was expected to extend the mine life for another 10 years (Resource Information Unit, 2004, p. 67, 123).

The Macraes Mine produced almost 5,000 kilograms (kg) of gold during 2003, which made it New Zealand's largest gold mining operation; the mine accounted for about 40% of the country's gold production. The mine also has the largest gold reserves in New Zealand (Resource Information Unit, 2004, p. 68; Ministry of Economic Development, 2002b§).

The Reefton gold project, which was owned by Australia-based GRD NL, was redesigned to be a multistage, two-mine development. The combined ore feed from the planned open pit at Globe Progress and the underground narrow-seam mine at nearby Blackwater was to be processed through a central plant facility at Globe Progress. The plant would have a combined ore output of 1.3 Mt/yr at a grade of 3.6 grams per metric ton (g/t) gold and would produce 3,700 to 4,000 kilograms per year (kg/yr) of gold.

The processing facility was to produce a high-value concentrate that would be transported to GRD's Macraes Mine for treatment though its pressure oxidation circuit. The redevelopment of the Blackwater Mine was planned as a mechanized narrow-vein mining operation that would produce approximately 1,300 kg/yr of gold at an average recovered grade of 13.0 g/t (NZ Mining Updates, 2003b)

In addition to these large gold operations, approximately 50 other small-scale gold mines operated in New Zealand in 2003 (Ministry of Economic Development, 2002a§).

Iron Ore.—Iron ore in the form of titanomagnetite-rich sand derived from the coastal erosion of volcanic rock was mined by NZ Steel from beach and dune sands and concentrated at two sites along the western coast of North Island. The Taharoa operation is located 150 km south of Auckland, and the Waikato North Head operation, 30 km south of Auckland.

The Taharoa ironsand site was leased by its Maori owners to NZ Steel beginning in 1968 until 2038. The ironsand was mined by a conventional cutter-suction dredge in dredge ponds. The heavy minerals were concentrated at the pond site by magnetic and gravity separation to produce a titanomagnetite ironsand concentrate of 57% iron. The product was pumped through twin 3-km-long slurry pipelines on to stockpiles near the ship-loading facility at the Port of Taharoa where it was exported to steel mills in China and Japan. Ironsand mining was worth about $19 million to New Zealand's economy (Ministry of Economic Development, 2003, p. 2; Resource Information Unit, 2004, p. 71).

NZ Steel had an exclusive license with the Government to mine the ironsand at its Waikato North Head site beginning in 1996 until 2096. Mining was done by two bucket-wheel excavators supported by a track-shiftable conveyor system. Processing of the ore was by the same methods used at Taharoa, but the resulting concentrate was about 59% iron. All Waikato North Head's production was piped to NZ Steel's 450,000-t/yr integrated steel plant at Glenbrook by an 18-km-long high-pressure slurry pipeline (Resource Information Unit, 2004, p. 71).

The Glenbrook Steelworks, which specialized in flat and coated products, produced hot-rolled coils, sheet and plate for pipemaking, heavy and light engineering and barge construction materials, cold-rolled steel for tubing, and hollow sections for agricultural products, commercial construction, and reticulation.

Industrial Minerals

New Zealand has extensive industrial mineral resources that include aggregate, bentonite, a wide variety of brick clays, diatomite, dolomite, halloysite, lime and limestone, perlite, pumice, salt, high-grade silica sand, building and dimension stone, and zeolite. Industrial minerals as a group were worth $204 million to the New Zealand economy in 2003 (Ministry of Economic Development, 2003c§).

Aggregates.—New Zealand's aggregate production was about 20.5 Mt/yr; about 14.3 Mt/yr was consumed on North Island. The industry was dominated by a small number of major companies, although a large number of smaller producers supplied smaller assignments locally (Ministry of Economic Development, 2003, p. 2).

Bentonite.—Bentonite clay was mined by Omya (NZ) Ltd. (Omya) in the Harper Hills volcanic terrain near Coalgate, which is located 65 km west of Christchurch, South Island. It is used as a binder for foundry sand, in drilling muds, and for sealing clay dams and diaphragm walls in construction projects, among other uses. Production totaled about 7,000 t/yr for domestic and export markets. Marine bentonite beds also have been mined in the past at Hawk Bay on the east-central coast of North Island (Ministry of Economic Development, 2003, p. 3; Resource Information Unit, 2004, p. 62).

Cement.—New Zealand had two cement manufacturing plants that used local high-grade limestone mixed with marl for their feed. The plant located at Portland near Whangarei, was operated by Golden Bay Cement Co. Ltd. The plant's production was about 490,000 t/yr. The plant located at Cape Foulwind near Westport, was operated by Milburn New Zealand Ltd. and produced about 470,000 t/yr (Ministry of Economic Development, 2003, p. 3-4).

Clays.—Kaolinite clays are used extensively for brick, ceramics, pipe, pottery manufacture, and tile. The largest brickmaking operation in New Zealand was the plant operated by CSR Building Materials (NZ) Ltd. in Auckland. Some kaolinite was also used as filler in adhesives, bitumen, and rubber. High-purity kaolinite was used by the New Zealand paper industry for paper coating and filling (Ministry of Economic Development, 2003, p. 3).

Diatomite.—Diatomite was quarried from several deposits for use as a mild abrasive, in insulation, for filtration, and as a pozzolan material used in cement. Diatom-rich lake deposits are interbedded with recent volcanic sediments in Northland, Auckland, South Auckland, Waikato, and at Rotorua, North Island. Diatomite Products Ltd. was developing the Ngakuru deposit of medium- to high-grade diatomite in the Waikite Valley, which is located 20 km south of Rotorua; production was expected to be about 20,000 cubic meters per year. At Middlemarch in Otago, diatomite lake deposits were being developed to provide high-grade filtration products. Marine diatomite deposits near Oamaru were also mined, principally for use as pet litter (Ministry of Economic Development, 2003, p. 3; Resource Information Unit, 2004, p. 65).

Dolomite.—Omya's plant at the Mount Burnett Quarry in northwest Nelson produced from 25,000 to 40,000 t/yr of dolomite, which was used as an additive to phosphatic fertilizers for spreading on magnesium-deficient soils. It was also used as aggregate and riprap, which is broken rock used to prevent erosion, such as in irrigation channels or seawalls (Ministry of Economic Development, 2003, p. 3-4).

Lime.—Limestone from Canterbury and marble from West Nelson were used by the major producer Omya for the manufacture of industrial-grade lime. Omya's main operation at Te Kuiti in South Waikato produced high-grade limestone with an output of about 50,000 t/yr. These materials were used as a filler in glass, paper, plastics, and rubber and for surface coating on paper.

Holcim (New Zealand) Ltd. (Milburn New Zealand Ltd. until September 2002) was a major producer of burnt lime through its subsidiary companies McDonalds Lime Ltd. on North Island and Taylors Lime Co. Ltd. on South Island. McDonalds quarried high-grade crystalline limestone at Otorohanga in Waikato and produced nearly 500,000 t/yr of lime products that were used in agriculture, steelmaking at the Glenbrook Mill, domestic paper pulp manufacture, gold ore processing at the Martha Hill Mine, sewage sludge and waste-water treatment, soil stabilization, and the sugar industry.

Taylors Lime, which operated a plant near Dunedin, supplied burnt lime and ground limestone mainly for use in processing gold ore at the Macraes Mine. Other uses included agriculture, sewage sludge and waste-water treatment, and soil stabilization. Additionally, the market for finely ground limestone for the glass, plastic, and rubber industries was expanding (Ministry of Economic Development, 2003, p. 4-5).

Pumice.—Pumice was quarried from very large pyroclastic deposits (rock material that was explosively ejected from a volcanic vent) in the Taupo Volcanic Zone and dredged with sands from alluvium in the Waikato River on North Island. Estimated production was 500,000 t/yr. The main uses of pumice were as fill for road construction and as sand for use in concrete block manufacture, foundations, and drainage systems. It also was used in horticultural soil mixes and exported for use in the "stone washing" of denim clothes (Ministry of Economic Development, 2003, p. 6).

Salt.—Salt was produced by solar evaporation of sea water by Dominion Salt Ltd. at Grassmere, which is located south of Blenheim, South Island. The evaporation ponds were constructed in a low-lying area close to the sea, which increased the salt concentration from 2.5% to 20%. The ponds were separated into paddocks with gates to admit and retain seawater. The saturated brine was stored in deep ponds during the winter and pumped to crystallization ponds where a salt crust of up to 0.75 meter thick would form on the bottom of the ponds. The crust was then removed by special harvesters each year in late summer. Low rainfall, high sunshine hours, and adequate wind assisted in the evaporation process; the resulting salt production was about 60,000 t/yr. Dominion Salt also owned associated refineries on the same site and at Mount Maunganui, which supplied raw solar- and vacuum-dried salt to the domestic market for agricultural and dairy usage, as edible salt, and for leather tanning and water treatment. Dominion Salt also produced pharmaceutical salt, which is manufactured to British and American Pharmacopoeia Commission standards (Dominion Salt Ltd., 2004; Ministry of Economic Development, 2003, p. 6; Resource Information Unit, 2004, p. 73).

Stone, Dimension.—Stone is widely used for decorative walls and paving. Rocks used have included basalt, dacite, granite, limestone, marble, and sandstone (Ministry of Economic Development, 2003, p. 3).

Zeolite.—NZ Natural Zeolite Ltd. mined zeolite from three quarries in the Taupo Volcanic Zone, which is located about 20 km south of Rotorua. Each quarry contained a unique zeolite. One quarry contained zeolite that absorbed odor and liquids extremely efficiently and was used in pet litter and as a granular oil/chemical and odor absorbent. Another quarry contained zeolite that had a high cation-exchange capacity and absorbed liquids, but was resilient to mechanical breakdown; this zeolite was used for absorbing cations from waste water and as a base for slow-release fertilizers. Zeolite from the third quarry was used in cosmetics, as a filler, and for other specialized products. Specialized crushing and screening equipment was necessary to produce the different products (Resource Information Unit, 2004, p. 74).

Mineral Fuels

Coal.—In 2003, New Zealand produced various grades of coal from about 45 mines. Of these mines, only nine produced 100,000 t or more per year of coal: two mines (one underground and one open cast) produced bituminous coal, and six mines (two underground and four open cast) produced subbituminous coal. In addition, a single lignite opencast operation mined at least 100,000 t/yr (Ministry of Economic Development, 2003a§).

Of the nine mines that produced 100,000 t or more per year of coal, five were owned by Solid Energy New Zealand Ltd. (Solid Energy), which was New Zealand's leading producer and exporter of coal, and a subsidiary. Huntly East subbituminous underground mine (owned by Solid Energy) is located at Huntly, which is 94 km south of Auckland, North Island. The Rotowaro open cut sub-bituminous mine (owned by Solid Energy) is located at Rotowaro, which is 10 km south of Huntly. The Spring Creek bituminous underground mine (owned by Solid Energy subsidiary Greymouth Coal Operating Co. Ltd.) was located at Rapahoe in the Greymouth Coalfield, which is 12 km north of Greymouth, South Island. The Stockton open cut mine (owned by Solid Energy) is located on the Stockton-Denniston Plateau, which is 35 km northeast of Westport, North Island. The Wairaki No. 6 subbituminous underground mine (owned by Solid Energy) is located at Ohai, which is 77 km northwest of Invercargill (Ministry of Economic Development, 2003a§, e§, i§-k§, m§).

Two of the nine mines were owned by Glencoal Energy Ltd. (Glencoal). The Kopako opencast subbituminous mine is located at Maramarua, which is 70 km south of Auckland. The Renown opencast subbituminous mine is located at Rotowaro, which is 10 km south of Huntly and 104 km south of Auckland (Ministry of Economic Development, 2003f§, h§).

The remaining two of the nine mines are the Summit open cut subbituminous mine (owned by MacDougall Mining Co. Ltd.), which is located at Rotowaro approximately 10 km southwest of Huntly, and the New Vale lignite mine (owned by New Vale Coal Co. Ltd.), which is located in the Waimumu Coalfield approximately 60 km northeast of Invercargill (Ministry of Economic Development, 2003g§, l§).

Natural Gas and Petroleum.—Hydrocarbons are found in most New Zealand sedimentary basins that were formed during the past 100 million years, but it is only since the 1960s that hydrocarbon production has been significant in terms of New Zealand's economy and fuel needs. The Taranaki Basin has been the main focus for hydrocarbon exploration and production in New Zealand. In 2003, oil and gas was produced from nine fields in the Taranaki Basin. Another six discoveries, all of which were also in the Taranaki Basin, were under appraisal (Ministry of Economic Development. 2003n§).

All the gasfields and oilfields contained condensate, gas, and oil. About 60% of the discovered reserves were contained in the offshore Maui Field, and an additional 22%, in the offshore Kapuni Field. Both fields, however, were nearing depletion (Ministry of Economic Development, 2003o§).

About 60% of New Zealand's condensate, crude, and naphtha production was exported. The balance was used as partial feedstock for the Marsden Point Refinery near Whangarei; the remainder of the crude oil used for the refinery feed was of Middle Eastern and Far Eastern origin. Although the refinery began operating in 1964, modernization and expansion of the refinery in 1986 made New Zealand self-sufficient in all refined products. About two-thirds of the refinery's product, which included export and domestic disbursements, was distributed by sea. The remaining production traveled 170 km by pipeline to the Wiri terminal in Auckland for further distribution by tanker trucks to Auckland and nearby regions. A pipeline to distribute jet fuel ran from the Wiri terminal to Auckland International Airport.

Infrastructure

The transportation infrastructure of New Zealand was well-developed. International shipping ports included Auckland, Christchurch, Dunedin, Tauranga, and Wellington. The merchant marine fleet of nine ships included one petroleum-oil-lubricant tanker. Pipelines included 2,213 km for natural gas, 304 km for refined petroleum products, 160 km for petroleum, and 79 km for liquefied petroleum gas (U.S. Central Intelligence Agency, 2003).

Outlook

Production of New Zealand's mineral wealth is expected to continue to grow as more foreign exploration companies explore the country, especially for precious metals (gold, platinum, and silver) and for hydrocarbons.

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TABLE 1

NEW ZEALAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		1999	2000	2001[e]	2002	2003 [e]
METALS						
Aluminum metal, smelter:						
Primary		326,738	328,400	322,300 [2]	333,900 [r]	334,400 [2]
Secondary[e]		21,400	21,500	21,500	21,500	21,500
Total		348,138	349,900 [e]	343,800 [2]	355,400	355,900
Gold, mine output, Au content	kilograms	8,577	9,880	9,885 [2]	9,770 [e]	9,305 [2]
Iron and steel:						
Iron sand, titaniferous magnetite, gross weight	thousand tons	2,303	2,692	1,636 [2]	1,740	1,947 [2]
Pig iron[e]	do.	620	600	600	600	600
Steel, crude	do.	744	765	770 [2]	750 [e]	800
Lead, refinery output, secondary[e]		6,000	10,000	10,000	10,000	10,000
Silver, mine output, Ag content	kilograms	24,308	22,886	27,120 [2]	28,720	29,930 [2]
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand tons	960	950	950	950	950
Clays:						
Bentonite		12,300	9,800	10,000	7,800	10,940 [2]
Kaolin, pottery		16,700	16,300	15,000	17,200	14,780 [2]
For brick and tile		50,700	69,800	70,000	47,500	56,550 [2]
Diatomaceous earth		25	15	15	20	320 [2]
Lime[e]		20,000	20,000	20,000	20,000	20,000
Marble[e]		15,000	15,000	15,000	15,000	15,000
Nitrogen, N content of ammonia		110,100	105,300	116,900 [2]	109,200	110,000
Perlite[3]		1,900	2,200	2,200	7,050	5,000 [2]
Pumice		124,300	68,000	68,000	203,700	173,400 [2]
Salt[e]		65,000	60,000	70,000 [2]	70,000	70,000
Sand and gravel:						
Silica sand, glass sand		41,200	47,400	47,500	60,150	48,400 [2]
Other industrial sand		816,100	660,300	660,000	575,700	2,207,170 [2]
For roads and ballast	thousand tons	16,377	18,336	18,000	18,522	18,500
For building aggregate	do.	6,547	7,499	7,500	8,026	8,000
Stone:						
Dolomite		57,920	47,800	47,500	28,400	21,920 [2]
Limestone and marl:						
For agriculture	thousand tons	1,993	2,029	2,000	2,732	2,553 [2]
For cement	do.	1,582	1,603	1,600	1,697	1,652 [2]
For other industrial uses	do.	482	527	500	865	672 [2]
For roads[e, 4]	do.	20,000	20,000	20,000	20,000 [r]	20,520 [2]
Serpentine		91,400	51,500	51,500	61,300	68,960 [2]
Dimension		20,600	28,700	29,000	30,200	37,300 [2]
Rock for harbor work[e]	thousand tons	1,500	1,500	1,500	1,500	1,500
MINERAL FUELS AND RELATED MATERIALS						
Carbon dioxide, liquefied[e]		10,000	10,000	10,000	10,000	10,000
Coal, all grades	thousand tons	3,505	3,586	3,911 [2]	4,459	5,180 [2]
Gas:[e]						
Manufactured, from gasworks	thousand cubic meters	11,000	11,000	11,000	11,000	11,000
Natural:						
Gross production	million cubic meters	5,600 [r]	5,700 [r]	5,750 [r]	5,780 [r]	5,800
Marketed production	do.	4,050	4,100	4,500	5,000	5,000
Natural gas liquids:[e]						
Liquefied petroleum gas	thousand 42-gallon barrels	2,000	2,000	2,000	2,100	2,200
Natural gasoline	do.	700	700	700	750	800
Total	do.	2,700	2,700	2,700	2,850	2,900
Peat	cubic meters	89,500	97,200	95,000	90,000	90,000

See footnotes at end of table.

TABLE 1--Continued
NEW ZEALAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		1999	2000	2001[e]	2002	2003 [e]
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum:						
Crude[e]	thousand 42-gallon barrels	14,960	13,160 [r]	12,400 [r]	11,700 [r]	8,711 [2]
Refinery products:						
Gasoline	do.	8,500	8,500	9,000	9,000	9,000
Distillate fuel oil	do.	13,000	13,000	14,000	14,000	14,000
Residual fuel oil	do.	3,500	3,500	4,000	4,000	4,000
Other	do.	3,500	3,500	4,000	4,000	4,000
Refinery fuel and losses[e]	do.	2,000	2,000	3,000	3,000	3,000
Total	do.	30,500	30,500	34,000	34,000	34,000

[e]Estimated. [r]Revised.
[1]Table includes data available through October 1, 2004.
[2]Reported figure.
[3]Includes zeolite.
[4]Includes dolomite.